



CIVIL-TECH CONSULTANTS AND ENGINEERS
Building & Highway Material Testing Laboratory
An ISO 9001:2008 Certified Company
NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005



Job No.: CTCF/BBMP/KRIDL/WNo.13/SDBC/ACG/2016-17

12.04.2016

Aggregate Gradation Test

IS : 2386 Part I

Client	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements and Asphaltting to 1st and 2nd Main road of BHEL Mini colony and other roads in Mallasandra, in Shettyhalli Sub Division, Ward No.13, BBMP, Bangalore.
Reference	No. EE/DD/WO / 2015-16
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	12.04.2016



SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cumulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH
9.5	488	8.7	8.71	91.29	90-100	Gradation satisfies Grade-II MORTH
4.75	2960	52.9	61.57	38.43	35-51	Gradation satisfies Grade-II MORTH
2.36	715	12.8	74.34	25.66	24-39	Gradation satisfies Grade-II MORTH
1.18	465	8.3	82.64	17.36	15-30	Gradation satisfies Grade-II MORTH
0.3	390	7.0	89.61	10.39	9-19	Gradation satisfies Grade-II MORTH
0.075	315	5.6	95.23	4.77	3-8	Gradation satisfies Grade-II MORTH
Total Weight of Sample: 5600 gm						

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cumulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH
9.5	470	8.5	8.47	91.53	90-100	Gradation satisfies Grade-II MORTH
4.75	2850	51.4	59.82	40.18	35-51	Gradation satisfies Grade-II MORTH
2.36	760	13.7	73.51	26.49	24-39	Gradation satisfies Grade-II MORTH
1.18	420	7.6	81.08	18.92	15-30	Gradation satisfies Grade-II MORTH
0.3	435	7.8	88.92	11.08	9-19	Gradation satisfies Grade-II MORTH
0.075	320	5.8	94.68	5.32	3-8	Gradation satisfies Grade-II MORTH
Total Weight of Sample: 5550 gm						

Note:

- P This test report should not be reproduced except in full, without written approval of the laboratory
P The results indicated above are based on the tests carried out on the samples received in the laboratory
P Any Query regarding the report must be reported within 30 days from the date of testing



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Job No.: CTCB/BBMP/KRIDL/WNo.13/SDBC/Stability/2016-17 12.04.2016

TEST REPORT ON STABILITY OF MIX

Client	: Asst. Executive Engineer, Shetthalli Sub Division, BBMP, Bangalore.
Agency	: Technical Manager (West), KRIDL, Bangalore.
Name of the work	: Improvements and Asphaltting to 1 st and 2 nd Main road of BHEL Mini colony and other roads in Mallasandra, in Shetthalli Sub. Division, Ward No.13, BBMP, Bangalore.
Reference	: No. EE/DD/WO/ /2015-16
Source of location	: Hot mix Plant, Bangalore
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 12.04.2016



The results of the tests conducted on the bituminous mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshall Stability, at 60° C, Kn	9.30	9.60	8.2 Kn (min)
2	Marshall flow at 60° C, mm	3.20	3.25	2 - 4
3	Percent air voids	3.10	3.60	3 - 5
4	Percent voids in mineral aggregates (VMA %)	13.60	14.15	13 - 15
5	Percent voids filled with Bitumen (VFB %)	68.15	70.30	65 - 78
6	Density, g/cc	2.26	2.50	---

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Job No: CTCF/BMMP/KRIDL/WNo.13/CSR-04/004a/QB(SDBC)/2016-17 07.04.2016

TEST REPORT

*CUSTOMER	: Asst. Executive Engineer, Shettyhalli Sub Division, BMMP, Bangalore.
*AGENCY	: Technical Manager (West), KRIDL, Bangalore.
*NAME OF THE WORK	: Improvements and Asphaltting to 1 st and 2 nd Main road of BHEL Mini colony and other roads in Mallasandra, in Shettyhalli Sub Division, Ward No.13, BMMP, Bangalore.
REFERENCE	: No. EE/DD/WO/ /2015-16
*SAMPLE ID	: Bitumen
DATE OF SAMPLING	05.04.2016
DATE OF TESTING	07.04.2016

The results of the tests conducted on the bitumen sample using for Bituminous Macadam

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	83	80 to 100
2	Softening point, °C	IS :1205 -1978 (RA-2009)	46	Min. 40
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	295	Min. 220

*Information is furnished by the Customer/Representative.

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07.04.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements and Asphaltting to 1st and 2nd Main road of BHEL Mini colony and other roads in Mallasandra, in Shettyhalli Sub Division, Ward No.13, BBMP, Bangalore.
Reference	No. FE/DD/WO/ /2015-16
Source / Location	Hotmix Plant
Type of Mix	Bituminous Macadam
Date of Testing	07.04.2016

SI	No.	Details		Trial No.	Average
1		Total weight of aggregate sample filling the cylindrical measure = W_1 g	376	379	
2		Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	85	87	
3		Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	291	292	
4		Aggregate Impact value = percent fines	22.61	22.96	
		100* (W_2/W_1)%			22.78

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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07.04.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements and Asphaltting to 1st and 2nd Main road of BHEL Mini colony and other roads in Mallasandra, in Shettyhalli Sub Division, Ward No.13, BBMP, Bangalore.
Reference	No. EE/DD/WO/ /2015-16
Source / Location	Hotmix Plant
Type of Mix	Bituminous Macadam
Date of Testing	07.04.2016



SI	No.	Details		Trial No.	Average
1		Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	387	21.06
2		Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	78	84	
3		Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	304	303	
4		Aggregate Impact value = percent fines	20.42	21.71	
		$100 * (W_2/W_1)\%$			

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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- This test report should not be reproduced except in full, without written approval of the laboratory
- The results indicated above are based on the tests carried out on the samples received in the laboratory
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Job No.: CTCB/BBMP/KRIDL/WNo.13/BNL/Shape:1/2016-17 : 07.04.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE

AGGREGATES

Client	: Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: Technical Manager (West), KRIDL, Bangalore.
Name of Work	: Improvements and Asphaltting to 1st and 2nd Main road of BHEL Mini colony and other roads in Mallasandra, in Shettyhalli Sub Division, Ward No.13, BBMP, Bangalore.
Reference	: No. EF/DD/WO/ /2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminious Macadam
Date of Testing	: 07.04.2016

Flakiness Index = 11.64%

Elongation Index = 13.76%

Result : Combined Flakiness & Elongation index

25.40%

Comments:

→ Maximum allowable flakiness & Elongation Index for Bituminous Macadam is 30%

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